

CLAIMS

What is claimed is:

5 1. An apparatus for positioning an annular implant about the perimeter of an anatomic orifice, comprising:

 a first shaft having proximal and distal ends;

 a second shaft having proximal and distal ends and being slidably received within said first shaft;

10 a plurality of arms, each of said arms having a distal end deflectably mounted to said distal end of said second shaft; means operatively associated with said first shaft for deflecting a proximal end of each of said plurality of arms away from said second shaft when relative movement between said first and second shafts is effected;

15 means for releasably holding an annular implant to said proximal ends of said arms; and

 means detachably connectable to an annular implant for adjusting the circumference of said annular implant.

20 2. The apparatus of Claim 1, further comprising at least one sensor extending proximal to said annular implant when an annular implant is mounted to said proximal ends of said arms, for detecting when said sensor is in contact with an anatomical surface.

25 3. The apparatus of Claim 2, wherein said sensor comprises:

 a first end segment;

 an intermediate segment; and

30 a second end segment mounted to said intermediate segment for telescoping movement with respect thereto, said second end segment being capable of abutting said first end segment so as to substantially cover said intermediate segment.

4. The apparatus of Claim 3, wherein said second end segment is normally biased away from said first end segment.

5. The apparatus of Claim 3, wherein said first and second end segments are radiopaque, and wherein said intermediate segment is not radiopaque, whereby it can be visualized under radiographic examination whether said first and second end segments are abutting.

10. The apparatus of Claim 4, wherein said first and second end segments are comprised of a radiopaque material.

7. The apparatus of Claim 4, wherein said first and second end segments are coated with a radiopaque material.

15. 8. The apparatus of Claim 3, wherein said intermediate segment is a different color than said first and second end segments, whereby it can be visualized under endoscopy whether said first and second end segments are abutting.

20. 9. The apparatus of Claim 3, wherein said first and second end segments are metallic and said intermediate segment is non-metallic, whereby it can be visualized under magnetic resonance imaging whether said first and second end segments are abutting.

25. 10. The apparatus of Claim 3, wherein said first and second end segments are metallic and said intermediate segment is non-metallic, whereby it can be visualized under magnetic resonance imaging whether said first and second end segments are abutting.

30. 11. The apparatus of Claim 2, wherein said sensor comprises a microswitch which changes states when said sensor makes contact with an anatomical surface to provide a change in electrical signal indicative of said contact.

12. The apparatus of Claim 2, wherein said sensor comprises fiberoptic pathways spectral analytical techniques capable of detecting unique tissue qualities of the tissue at a desired site for implantation.

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13. The apparatus of Claim 2, wherein said sensor comprises electronic sensors capable of detecting a desired electrophysiologic quality of a desired tissue for proper implantation.

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14. The apparatus of Claim 13, wherein said sensor further signals an operator when said desired electrophysiologic quality is detected.

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15 15. The apparatus of Claim 1, wherein said means operatively associated with said first shaft for deflecting a proximal end of each of said plurality of arms away from said second shaft comprises a plurality of struts, each of said struts having a proximal end deflectably mounted to said distal end of said first shaft and having a distal end deflectably mounted to a corresponding one of 20 said plurality of arms.

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16. The apparatus of Claim 15,
wherein said distal end of each of said plurality of arms is pivotably mounted to said distal end of said second shaft;
wherein said proximal end of each of said plurality of struts is pivotably mounted to said first shaft; and
wherein said distal end of each of said plurality of struts is pivotably mounted to a corresponding one of said plurality of arms.

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17. The apparatus of Claim 1, further comprising a third shaft having proximal and distal ends, said first and second shafts being slidably received within said third shaft such that said plurality of arms and said means for deflecting said plurality of arms are enclosed within said distal end of said third shaft.

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18. The apparatus of Claim 1, wherein one of said first and second shafts has a radially extending key, and the other of said first and second shafts has a corresponding recess for receiving said key,
5 whereby rotational movement between said first and second shafts is inhibited.

19. The apparatus of Claim 17, wherein one of said second and third shafts has a radially extending key, and the other of said
10 second and third shafts has a corresponding recess for receiving said key, whereby rotational movement between said second and third shafts is inhibited.

20. The apparatus of Claim 1,
15 wherein said second shaft comprises a central lumen; and
wherein said means for releasably holding an annular implant to said proximal ends of said arms extends from a location distal to said distal end of said first shaft to a location proximal to said proximal end of said first shaft,
20 whereby a physician can manipulate said means for releasably holding an annular implant to said proximal ends of said arms from a location proximal to the proximal end of said first shaft.

25 21. The apparatus of Claim 1,
wherein said second shaft comprises a central lumen; and
wherein said means for adjusting the circumference of said
annular implant extends from a location distal to said distal
30 end of said first shaft to a location proximal to said proximal end of said first shaft,
whereby a physician can manipulate said means for adjusting the circumference of said annular implant from a location proximal to the proximal end of said first shaft.